QZX

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EDITOR'S NOTES

K5XY

You have already received the bad news and the good news. The bad news was that the last QZX slipped out of not only the right month but the next one too. There really is not a good excuse. I still have a bit of trouble with the publishing program, but the real reason is procrastination brought about , in part, but the lack of a back-log of articles. The good news is that the publishing program is more or less under control and that the next several issues are well planned already. In fact, if all goes as planned, you will be reading this issue only a month late, with the next one to arrive within weeks.

Future plans include more reference material suitable for making the Sinclair computers do more than just process programs. QSL cards are one of the more innovative things our computers can do. For them you need a good command of the graphic elements that the computers produce. Hence one of the tables in this issue.

QZX has been around for over ten years. I am becoming confused as to just what information has been published. Hence a complete alphabetized index is being built. I hope to have it finished in the next few months.

One of our readers suggested that a short history of QZX be written. I hope to do that too. It will be short because not that much has happened. True, it is over ten years old. But it has not evolved that much. It is not ten years of progress but rather ten years of steady (more or less) dissemination of Sinclair information of interest to ham radio operators.

You will notice that I have not mentioned plans to publish a lot of programs. These kinds of plans cannot be made without programs to publish. I do not have many unpublished programs. I would appreciate it if you would send me some new programs to be published. They do not have to be fancy. Not all of our readers are accomplished programmers, and many would welcome even very simple programs if they have some radio application. Any unpublished or improved published program will be welcome.

ZX81 Memory Map +

K5XY

The title promises a memory map of the ZX81 but will deliver a memory map of the TS1000 and TS1500 too because the memory map of all these computers is the same. For completeness the last page of this article will present a memory map of the ZX80. That page is finished out with a table which identifies the error codes for both types of machine.

Last month this section of QZX featured the TS1500 (ZX81, TS1000) system variables. This time a memory map of the computer is presented. Of course that memory map refers to the system variables too. But this article presents more information differently arranged.

The pages have been designed so that you can cut out the tables and use them near the computer for easy reference. You might want to cut a piece of cardboard to fit and glue the table to the cardboard to make them easier to handle and more durable.

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ZX81 MEMORY MAP		
ADDRESS		DESCRIPTION
DECIMAL	HEX	
0	0000H	MONITOR ROM.
8192	2000H	NOTHING. (USED FOR ROM IN SOME ADD-ON DEVICES).
16384	4000H	**ERROR-CODE MINUS ONE.**
16385	4001H	*BASIC SYSTEM CONTROL FLAG BITS.
16386	4002H	*ADDR OF NEXT INSTR AFTER "RETURN"ING.
16388	4004H	**ADDR OF LAST AVAIL BASIC BYTE +1.**
16390	4006H	**CURSOR MODE – K, L, F, OR G.**
16391	4007H	**CURRENT BASIC STMT NUMBER.**
16393	4009H	ROM VERSION CODE (0 = 8K).
16394	400AH	**BASIC STMT NUMBER AT) CURSOR.**
16396	400CH	***ADDRESS OF SCREEN.**
16398	400EH	**ADDRESS OF NEXT SCREEN PRINT POS.**
16400	4010H	*ADDRESS OF PROGRAM VARIABLES.
16402	4012H	ADDRESS OF ASSIGNMENT VARIABLE.
16404	4014H	*ADDR OF WORKING STORAGE (KEY INPUT).
16406	4016H	*ADDR OF BYTE AFTER PEEK OR POKE.
16408	4018H	**ADDRESS OF $ MARK MINUS ONE.**
16410	401AH	*ADDRESS OF MATH CALC STACK.
16412	401CH	*ADDR OF END OF MATH CALC STACK.
16414	401EH	B-REGISTER OF CALCULATOR.
16415	401FH	ADDRESS OF CALCULATOR MEMORY.
16417	4021H	NOT USED.
16418	4022H	***NUMBER OF LOWER-SCREEN LINES.**
16419	4023H	**NUMBER OF FIRST BASIC STMT ON SCREEN.**
16421	4025H	**LAST KEY PRESSED.**
16423	4027H	KEYBOARD DEBOUNCE STATUS.
16424	4028H	NUMBER OF BLANK LINES ABOVE AND BELOW MOVING GRAPHICS.
16425	4029H	***ADDR OF NEXT BASIC STMT LINE.**
16427	402BH	**NUMBER OF STMT TO "CONT"INUE AT.**
16429	402DH	SYSTEM FLAG BITS.
16430	402EH	STRING-TYPE LENGTH IN ASSIGNMENT.
16432	4030H	ADDR OF NEXT SYNTAX TABLE ENTRY.
16434	4032H	**RANDOM NUMBER SEED.**
16436	4034H	SCREEN FRAME DISPLAY COUNT.
16438	4036H	**LAST "PLOT" X-COORDINATE.**
16439	4037H	**LAST "PLOT" Y-COORDINATE.**
16440	4038H	**LSB OF ADDR OF NEXT "LPRINT" POSITION.**
16441	4039H	***"PRINT" COLUMN NUMBER.**
16442	403AH	***"PRINT" LINE NUMBER.**
16443	403BH	INTERNAL FLAG BITS.
16444	403CH	PRINTER BUFFER.
16477	405DH	CALCULATOR AUXILIARY MEMORY AREA.
16507	407BH	NOT USED.
16509	407DH	**USER PROGRAM AREA.**
17407	43FFH	END OF 1K SYSTEMS.
18431	47FFH	END OF 2K SYSTEMS.
32767	7FFFH	END OF 16K SYSTEMS.
* = DO NOT POKE. UNPREDICTABLE RESULTS.		
Addr 16393 (4009H) thru 16508 (407BH) are always SAVEd with the program.		

ZX80 MEMORY MAP		
ADDRESS		
DECIMAL	HEX	DESCRIPTION
16384	4000H	**ERROR-CODE MINUS ONE.**
16385	4001H	*BASIC SYSTEM CONTROL FLAG BITS.
16386	4002H	CURRENT BASIC STATEMENT NUMBER.
16388	4004H	**ADDRESS OF K OR L CURSOR.**
16390	4006H	**BASIC STATEMENT NUMBER AT) CURSOR.**
16392	4008H	*ADDRESS OF PROGRAM VARIABLES.
16394	400AH	*ADDRESS OF WORKING STORAGE (KEY INPUT)
16396	400CH	***ADDRESS OF UPPER SCREEN.**
16398	400EH	***ADDRESS OF LOWER SCREEN.**
16400	4010H	***ADDRESS OF END-OF-SCREEN.**
16402	4012H	***NUMBER OF LOWER-SCREEN LINES.**
16403	4013H	NUMBER OF FIRST BASIC STMT ON SCREEN.
16405	4015H	**ADDRESS OF $ MARK MINUS ONE.**
16407	4017H	**NUMBER OF STMT TO "CONTINUE" AT.**
16409	4019H	SYNTAX FLAG BITS.
16410	401AH	SYNTAX TABLE POINTER.
16412	401CH	**RANDOM NUMBER SEED.**
16414	401EH	SCREEN FRAME DISPLAY COUNT.
16416	4020H	ADDRESS OF FIRST CHAR OF FIRST VAR NAME IN LAST DIM, FOR, INPUT, LET, NEXT.
16418	4022H	VALUE OF LAST VAR OR EXPRESSION.
16420	4024H	***LINE POS OF NEXT SCREEN CHAR:** FROM 33 (LEFT) TO 2 (RIGHT) 1 = FIRST COL, NEXT LINE (LINE FULL) 0 = FIRST COL, (E-O-LINE.)
16421	4025H	***CURRENT SCREEN LINE (0=BOT, 23=TOP)**
16422	4026H	*ADDRESS OF CHAR AFTER PEEK OR POKE STMT.
16424	4028H	**USER PROGRAM AREA.**
* = DO NOT POKE. UNPREDICTABLE RESULTS.		

ERROR CODES	
ERROR CODES APPEAR AS: xx/yy WHERE: xx is the error code, AND: yy is the number of the last statement executed.	
CODE	**MEANING**
0	Successful execution, or, GOTO-line too big.
1	NEXT has invalid variable, but, variable is assigned.
2	Variable not assigned, or, DIMensioned.
3	Bad subscript.
4	Memory exhausted.
5	Screen full.
6	Arithmetic number too large.
7	RETURN before GOSUB.
8	INPUT attempted in command mode. Illegal.
9	STOP was executed.
ZX81 ONLY	
A	Invalid parameter.
B	Invalid integer.
C	Invalid data in VAL string.
D	BREAK was pressed.
E	Unused.
F	SAVE name is a null string. Illegal.

UNCLASSIFIED ADS

WANTED: UNCLASSIFIED ADS for publication in QZX. Cost is 1 cent for each keystroke (characters, blanks, etc.). Payment must be included with order. This is an excellent way to sell your program or unwanted equipment, ask for help, or find a specific program. Send your ad with payment to QZX, 2025 O'Donnell, Las Cruces, NM 88001.

QZX discount: 15% discount on all orders mentioning QZX. T & C Services (address in ad in this issue.)

FREE: One Byte-Back M 16 16 K RAM (no printed circuit board on the feed through socket). Contributed by KA8THG. It would be appreciated if a contribution toward the mailing expenses were made. Send requests to QZX, 2025 O'Donnell, Las Cruces, NM 88001.

FOR SALE: Back issues of QZX, $1.00 each postpaid. QZX, 2025 O'Donnell, Las Cruces, NM 88001.

FOR SALE: CP/M books. Almost new. Half original price. *The Programmer's CP/M Handbook* by Andy Johnson-Laird. Osborne. Hardback. 500 pages $419. *The Byte Guide to CP/M* by Mark Dahmke. Mc Graw Hill. 250 pages. $8.50. *CP/M Users Guide* by Thom Hogan. Osborne. 330 pages. $8.95. *The CP/M Plus Handbook* by Alan R. Miller. Sybex. 250 pages. $7.5. *Inside CP/M Plus* by David E. Cortesi. Holt-Rinehart. 260 pages. $9.25. *CP/M Bible* by Waite and Angermeyer. Howard Sams. 430 pages. $9.90. *Users Guide to CP/M Systems* by Bove and Rhodes. Baen. 300 pages. $4.50. $1.00 each shipping and handling. A. F. Burr, 2025 O'Donnell, Las Cruces, NM 88001.

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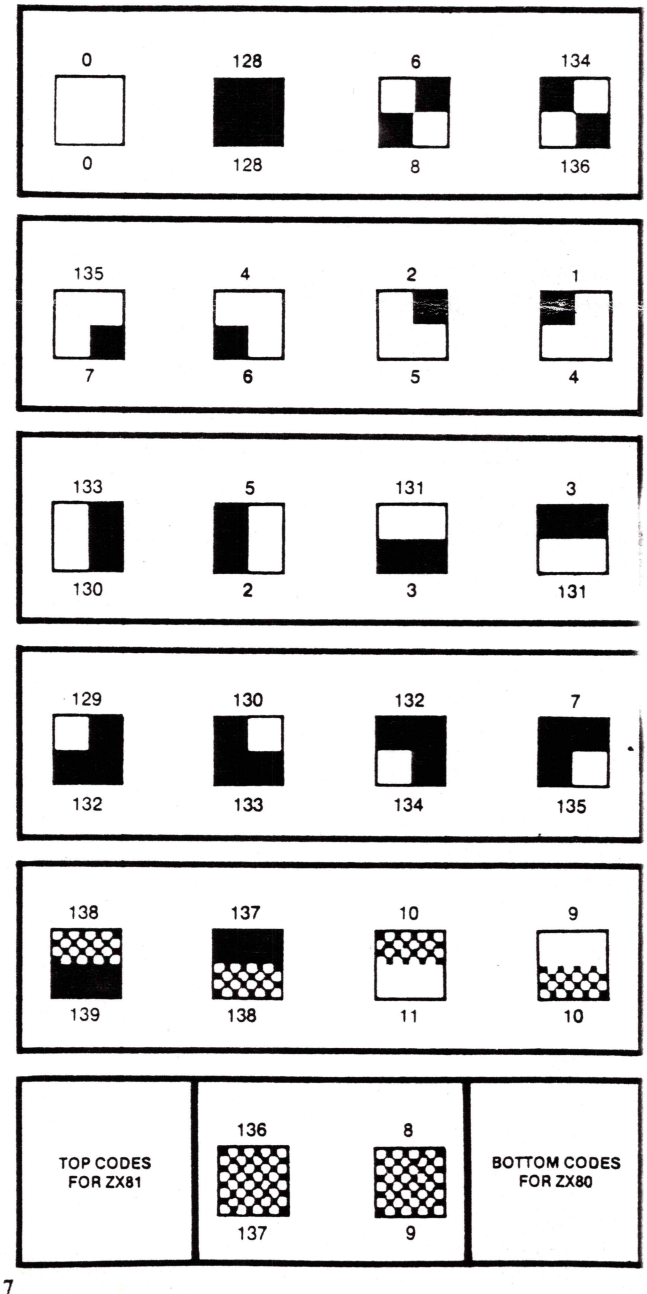
Graphic Codes for ZX80 and ZX81

K5XY

The ZX81, TS1000, and TS1500 are very compatible, but the ZX80 and ZX81 are not as closely related. The differences are much more sever than just a few extra commands added to the BASIC of the ZX81. Even the graphic elements (which *are* all the same) require different commands. The key design is the same but the command which is sent to the Z80 CPU are different.

The following table shows the desired decimal coded byte necessary to produce the given graphic element on the screen. The codes for the ZX81 are listed on the top. The codes for the ZX80 are listed on the bottom. Almost all of them are different. No wonder graphics programmed for the ZX80 look different on the



73, K5XY

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